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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SWERDLOW, DANIEL	

ART UNIT	PAPER NUMBER
2644	16

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/819,158	NORRELL ET AL.	
	Examiner	Art Unit	
	Daniel Swerdlow	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 November 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☒ Claim(s) *6,16 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *15*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claims 6, 16 and 23 are objected to because of the following informalities:

2. Claim 6 includes the limitation "wherein the first capacitive element to electrically connect in series with the intra-winding capacitance of the first winding". As recited, this limitation is grammatically incorrect. Examiner assumes it is intended as "wherein the first capacitive element is electrically connected in series with the intra-winding capacitance of the first winding".

3. Claim 16 includes the limitation "wherein the first capacitive means to electrically connect in series with an inter-winding capacitance of the inductive means". As recited, this limitation is grammatically incorrect. Examiner assumes it is intended as "wherein the first capacitive means is electrically connected in series with an inter-winding capacitance of the inductive means".

4. Claim 23 includes the limitation "wherein the first capacitive element to electrically connect in series with the inter-winding capacitance of the first inductor winding". As recited, this limitation is grammatically incorrect. Examiner assumes it is intended as "wherein the first capacitive element is electrically connected in series with the inter-winding capacitance of the first inductor winding".

5. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 6 through 10, 16, 18 through 21, 23 and 25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

8. Claim 6 includes the limitation "wherein the first capacitive element to electrically connect in series with the intra-winding capacitance of the first winding". This configuration is not described in the original specification.

9. Claims 7 through 10 and 25 fail to comply with the written description requirement due to dependence from Claim 6.

10. Claim 16 includes the limitation "wherein the first capacitive means to electrically connect in series with an inter-winding capacitance of the inductive means". This configuration is not described in the original specification.

11. Claim 18 includes the limitation "amplifying the DSL signals between the first segment of the local loop and the second segment of the local loop but after the ... coupled inductor". This configuration is not described in the original specification.

12. Claims 19 through 21 fail to comply with the written description requirement due to dependence from Claim 18.

13. Claim 23 includes the limitation "wherein the first capacitive element to electrically connect in series with the inter-winding capacitance of the first inductor winding". This configuration is not described in the original specification.

14. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

15. Claims 6 through 10, 18 through 21, 23 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

16. Claim 6 includes the limitations "a first capacitive element disposed in parallel with the first winding" and "wherein the first capacitive element to electrically connect in series with the intra-winding capacitance of the first winding". Intra-winding capacitance results from the capacitance between adjacent loops of an inductor winding and as such is an equivalent capacitance across (i.e., in parallel with) the inductor (see Transformer General Parameters). Therefore, "a first capacitive element disposed in parallel with the first winding" would inherently be in parallel with the intra-winding capacitance of the first winding and could not simultaneously be "in series with the intra-winding capacitance of the first winding". As such it is unclear whether the first capacitive element is in series or parallel with the intra-winding capacitance. Therefore, the claim is indefinite.

17. Claims 7 through 10 and 25 are indefinite due to dependence from Claim 6.

18. Claim 18 includes the limitations "inductively coupling a first segment of the local loop to a second segment of the local loop via a coupled inductor" and "amplifying the DSL signals

between the first segment of the local loop and the second segment of the local loop but after the ... coupled inductor". Since the inductor couples together the two loop segments, it is unclear how the amplification can simultaneously take place between the segments and after the inductor. Therefore the claim is indefinite.

19. Claims 19 through 21 are indefinite due to dependence on Claim 18.

20. Claim 23 includes the limitations "a first capacitor coupling the first wire to the fourth wire" and "wherein the first capacitive element to electrically connect in series with the inter-winding capacitance of the first inductor winding". Inter-winding capacitance results from the capacitance between the different windings of a transformer and as such is an equivalent capacitance between the windings (see Testing Inter-winding Capacitance). Therefore, "a first capacitor coupling the first wire to the fourth wire" would inherently be in parallel with the inter-winding capacitance between the windings and could not simultaneously be "in series with the inter-winding capacitance of the first inductor winding". As such it is unclear whether the first capacitive element is in series or parallel with the inter-winding capacitance. Further, since inter-winding capacitance is the capacitance between two different windings, the meaning of "the inter-winding capacitance of the first inductor winding" is unclear. Therefore, the claim is indefinite.

Claim Rejections - 35 USC § 103

21. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

22. Claims 1, 2, 3, 5, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quarles (US Patent 1,711,653) in view of Federal Telephone and Radio Corporation (FTRC) (Reference Data for Radio Engineers).

23. Claim 1 claims a load coil comprising a coupled inductor with two windings having an interwinding capacitance value between them wrapped about an inductor core with a first capacitive element between the input of the first winding and the output of the second winding and a second capacitive element between the input of the second winding and the output of the first winding. Quarles discloses a load coil comprising a coupled inductor with two windings that inherently have an interwinding capacitance value between them wrapped about an inductor core with capacitors connected diagonally across the windings (i.e., between the input of the first winding and the output of the second winding; and between the input of the second winding and the output of the first winding) (Fig. 1 and page 1, lines 99-102). Claim 1 further claims each have capacitance values at least four times the inter-winding capacitance value. Quarles specifies the value of the capacitors as being half of the value to be used between the middle points of the loading coils (page 4, lines 58-64) which is specified to be between .4 and .8 of the total between the wires of one section of the loop. Quarles therefore teaches a value of the capacitors between .2 and .4 of the capacitance of a loop section. Federal Telephone and Radio Corporation teaches that the capacitance of a mile of 24 AWG telephone transmission line is .075 μF (page 111). A 6,000 foot loop section, therefore, has a capacitance of .075(6000/5280) μF which is equal to .085 μF or 85 nF. Hence, the values Quarles teaches are between .2(85)nF and .4(85) nF, that is, between 17 nF and 34 nF. It would have been obvious to one skilled in the art at the time of the invention to utilize the published values for transmission line capacitance to

calculate the capacitances taught by Quarles for the purpose of implementing Quarles's invention. The inter-winding capacitance of a load coil is 1,150 pF (see US Patent 6,546,100 to Drew, column 2, lines 32-33), which equals 1.15 nF. As such, the load coil made obvious by the combination of Quarles and FTRC has capacitance values that are at least 14.8 times the inter-winding capacitance value. Therefore, the combination makes obvious all elements of Claim 1. Claim 1 contains language indicating the inductor is configured to counteract capacitance across the loop to improve transmission of POTS-based signals and that the capacitive elements are configured to permit passage of DSL signals. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Because the load coil made obvious by the combination of Quarles and FTRC is structurally identical to the load coil of Claim 1, the recitation related to use carries no weight.

24. Claim 2 claims the load coil of Claim 1 wherein the capacitive elements have a capacitance in the range of 10 nF to 82 nF. As stated above apropos of Claim 1, the combination of Quarles and FTRC makes obvious all elements of that claim. In addition, as stated above apropos of Claim 1, the combination makes obvious capacitive elements having a capacitance of 17 nF to 34 nF. Therefore, the combination makes obvious all elements of Claim 2.

25. Claim 3 claims the load coil of Claim 1 wherein the capacitive elements have a capacitance in the range of 5 nF to 50 nF. As stated above apropos of Claim 1, the combination of Quarles and FTRC makes obvious all elements of that claim. In addition, as stated above

apropos of Claim 1, the combination makes obvious capacitive elements having a capacitance of 17 nF to 34 nF. Therefore, the combination makes obvious all elements of Claim 3.

26. Claim 5 claims the load coil of Claim 1 wherein the capacitive elements increase the effective interwinding capacitance of the inductor windings by at least a factor of 5. As stated above apropos of Claim 1, the combination of Quarles and FTRC makes obvious all elements of that claim. In addition, as stated above apropos of Claim 1, the combination of Quarles and Federal Telephone and Radio Corporation makes obvious capacitance values between 17 nF and 34 nF. Applicant discloses that capacitances in the range of 5 nF to 50 nF increase the effective interwinding capacitance by a factor of five to ten (page 13, lines 15-18). Therefore, it is inherent in the values taught by Quarles and FTRC that they increase the effective interwinding capacitance of the inductor windings by at least a factor of 5.

27. Claim 22 is essentially similar to Claim 1. Claim 22 is rejected for the reasons stated above apropos of Claim 1.

28. Claim 24 claims the load coil of Claim 1 wherein the capacitive elements have a capacitance value at least five times the interwinding capacitance value. As stated above apropos of Claim 1, the combination of Quarles and FTRC makes obvious all elements of that claim. In addition, as stated above apropos of Claim 1, the load coil made obvious by the combination of Quarles and FTRC has capacitance values that are at least 14.8 times the inter-winding capacitance value. Therefore, the combination makes obvious all elements of Claim 24.

29. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quarles in view of FTRC and further in view of Pinel (US Patent 3,848,098). Claim 4 claims the load coil of Claim

1 wherein the coupled inductor has an inductance of about 66 mH. As stated above apropos of Claim 1, Quarles discloses all relevant elements of that claim. Therefore, Quarles discloses all relevant elements of Claim 4 with the exception of specification of the inductance value. Pinel discloses that 66 mH is a typical value for inductors used as loading coils on analog telephone lines (column 3, lines 11-14). It would have been obvious to one skilled in the art at the time of the invention to use a load coil with a typical inductance value in the system disclosed by Quarles for the purpose of having a loading coil easily obtainable in forms suitable for use in outside plant telephone installations.

30. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Quarles in view of FTRC and further in view of Shenoi et al. (US Patent 6,507,606).

31. All elements of Claim 11 are comprehended by Claim 1 with the exception that Claim 11 claims a DSL signal repeater for disposal along the local loop to amplify the DSL signals, the repeater including a load coil for conditioning POTS signals. As stated above apropos of Claim 1, the combination of Quarles and FTRC makes obvious all elements of that claim. Therefore, the combination makes obvious all elements of Claim 11 with the exception of a DSL signal repeater for disposal along the local loop to amplify the DSL signals, the repeater including a load coil for conditioning POTS signals. Shenoi discloses a DSL repeater (Fig. 4, reference 400; column 7, lines 54-55) that includes load coils (column 7, lines 59-63). It would have been obvious to one skilled in the art at the time of the invention to combine the repeater taught by Shenoi with the combination made obvious by Quarles and FTRC for the purpose of providing DSL over long loaded loops.

32. Claim 12 claims the system of Claim 11 wherein the coupled inductor has first and seconds windings with capacitive elements disposed diagonally across those windings. As stated above apropos of Claim 11, the combination of Quarles and FTRC makes obvious all elements of that claim. In addition, Quarles discloses diagonal disposal of capacitors in a loading coil. Therefore the combination makes obvious all elements of Claim 12.

33. Claims 11, 13 through 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Drew in view of Shenoi.

34. All elements of Claim 11 are comprehended by Claim 6 with the exception that Claim 11 claims a DSL signal repeater for disposal along the local loop to amplify the DSL signals, the repeater including a load coil for conditioning POTS signals. As stated above apropos of Claim 6, Drew anticipates all elements of that claim.

35. Claim 11 claims a load coil for disposal along a local loop. Drew discloses a load coil for a two-conductor transmission line that corresponds to the local loop claimed (column 1, lines 31-37). Claim 11 further claims the load coil includes a coupled. Drew discloses a coupled inductor (Fig. 4, reference 42, 44; column 2, line 62 through column 3, line 2). Claim 11 further claims the load coil includes multiple capacitive elements. Drew discloses a capacitors (Fig. 4, reference 46, 48; column 3, lines 2-3) connected in parallel across the first winding and the second winding. Claim 11 further claims the capacitive elements have capacitance values relative to a capacitance value of either the coupled inductor to improve transmission of DSL signals across the load coil. Drew discloses the capacitors that correspond to the capacitive elements claimed having capacitance values of 50 nF to 100 nF (column 3, lines 12-15) and a

parasitic winding capacitance (Fig. 4, reference C'w; column 3, lines 5-12) that corresponds to the intra-winding capacitance claimed having a value of 288 pF (0.288 nF) (column 2, lines 26-28). Further, Drew discloses that these capacitance values allow the capacitors to provide a low impedance path for high frequency signals to bypass the windings (i.e., permit passage of DSL signals across the load coil) (column 3, lines 18-20). Therefore, Drew anticipates all elements of Claim 11 with the exception of a DSL signal repeater for disposal along the local loop to amplify the DSL signals, the repeater including a load coil for conditioning POTS signals. Shenoi discloses a DSL repeater (Fig. 4, reference 400; column 7, lines 54-55) that includes load coils (column 7, lines 59-63). It would have been obvious to one skilled in the art at the time of the invention to combine the repeater taught by Shenoi with the load coil taught by Drew for the purpose of providing DSL over long loaded loops.

36. Claim 13 claims the system of Claim 11 with first and second windings and capacitive elements disposed in parallel with those windings. As stated above apropos of Claim 11, the combination of Drew and Shenoi makes obvious all elements of that claim. In addition, as stated above apropos of Claim 6, Drew discloses capacitive elements disposed in parallel with the windings. Therefore the combination makes obvious all elements of Claim 13.

37. Claim 14 claims the system of Claim 11 wherein the capacitive elements have a capacitance value in the range of 10 nF to 82 nF. As stated above apropos of Claim 11, the combination of Drew and Shenoi makes obvious all elements of that claim. In addition, as stated above apropos of Claim 6, Drew discloses capacitive elements having a capacitance of 50 nF to 100 nF. Therefore, the combination makes obvious all elements of Claim 14.

38. Claim 15 claims the load coil of Claim 11 wherein the capacitive elements have a capacitance in the range of 5 nF to 50 nF. As stated above apropos of Claim 11, the combination of Drew and Shenoi makes obvious all elements of that claim. In addition, as stated above apropos of Claim 6, Drew discloses capacitive elements having a capacitance of 50 nF to 100 nF. Therefore, the combination makes obvious all elements of Claim 15.

39. All elements of Claim 17 are comprehended by Claim 11. Claim 17 is rejected for the reasons stated above apropos of Claim 11.

Response to Arguments

40. Applicant's arguments with respect to claims 6 through 10, 16, 18 through 21, 23 and 25 have been considered but are moot in view of the new ground(s) of rejection.

41. Applicant's remaining arguments filed 12 November 2003 have been fully considered but they are not persuasive.

42. Regarding Claim 1, applicant alleges that the combination of Quarles and FTRC fails to make obvious the use of diagonally disposed capacitors with capacitance values at least four times the value of the interwinding capacitance of the load coil. Examiner respectfully disagrees. As examiner has demonstrated in the prior Office action, one skilled in the art seeking to practice the invention of Quarles using available reference materials would arrive at capacitor values that meet the claim. Quarles discloses capacitance values relative to the length of a local loop segment. As demonstrated by examiner in the prior Office action, the industry standard segment length of 6,000 feet (or 1.135 miles as shown in the table on p. 110 in FDRC) results in capacitor values that meet the claim. As such, one skilled in the art seeking to practice the invention of

Quarles using the disclosure of Quarles and a reference work in the same field endeavor (i.e., FDRC) would arrive at capacitor values that meet the claim. Applicant alleges that the value of interwinding capacitance in Drew is not applicable. Examiner disagrees. Drew discloses a typical interwinding capacitance of a prior art load coil. As such, the value is generally applicable to load coils.

43. Applicant's arguments regarding Claim 22 are essentially similar to those regarding Claim 1 and are not persuasive for the same reasons.

44. Regarding Claims 11, 13 through 15 and 17, applicant alleges that the combination of Drew and Shenoi fails to make obvious "capacitive elements have capacitance values relative to a capacitance value of the coupled inductor". Examiner respectfully disagrees. Any capacitance has a value relative to any other capacitance. For example, if a first capacitance has a value of C1 and a second capacitance has a value C2 then inherently either C1>C2 or C1<C2 or C1=C2. As such, C1 has a value relative to C2. Applicant makes reference in the arguments to "the selection of capacitive values", but in a claim that claims both a product and the method of making the product (i.e., a product-by-process claim), patentability is determined based on the product itself. As such, limitations relating to the method by which the capacitance values are selected carry no weight.

Conclusion

45. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Swerdlow whose telephone number is 703-305-4088. The examiner can normally be reached on Monday through Friday between 8:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forrester Isen can be reached on 703-305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

ds

XU MEI
PRIMARY EXAMINER